3: Robequain--113-116 S-5 (no date) 1944 Laotians-1-5
116, 133, 503, 505, 177.50 France
636.50

"The Mekong appeared to offer a splendid means of penetrating the plateaus and mountains of Laos. At one time it was even suggested that Saigon could be one of the great ports for Southern China. As early as 1866, the Doudart de Lagrée and Francis Garnier mission realized the difficulties[114]of navigating the river above Kratié. This large river, as a matter of fact, is still very young as far as physical geography is concerned, or rather, a series of recent and still only partially explained tectonic episodes have renewed its youth. It consists of a chain of calm-surfaced reaches, separated by rapids or falls. The chief obstacle to navigation is at Khône where the arms of the river, spread out over an area several kilometers wide, drop 15 meters through torrential and rock-studded channles or cataracts. Here precisely is the border between Cambodia and Laos. Other rapids are scattered both up and down stream, making navigation by launch difficult and uncertain throughout entire sections between Kratié and Savannakhet. It is only at Savannakhet ('the gateway to paradise') that the great navigable reaches begin which permit launches to sail as far as several kilometers above Vientiane without breaking bulk.

Europeans were eager to tame the Mekong. As early as 1890 the Messageries

3: Robequain--113-116 S-5 (no date) 1944 Laotians-2
116, 133, 503, 505, 177.50 France
636.50

Fluviales de Cochinchine had organized a steamship line which, with the help of some trans-shipment, operated as far as Khône. For more than two years the launch, Argus, tried to get past the Khône barrier through the channels which canoes sometimes used in descending the river. In view of the failure of these attempts, a narrow guage railway was built across Khône Island, and by this means gunboats and then launches were carried to the upper river in 1893.

Conditions of navigation have been improved since then, but scouring the river channels has not always produced the desired results, since the river's reactions are difficult to predict; buoying had been improved up to 1925; more than a thousand towers, buoys and landmarks had been built. Hundred-ton launches, drawing one and one half meters, can reach as far as Khône, at high water, about three months a year; in other months, the section between Kratié and Khône, much of which had to be traversed by canoe up to 1900, can now be covered, with only one trans-shipment, by a short thirty-ton launch which can manage the sharp turns of the narrow channels. Above Khône, the most difficult passage is through the sandstone canyon of Kemmarat, where the river attains [115] a depth of eighteen meters during the heavy floods and the current in some rapids is from nine to ten knots. Since 1910 more powerful launches have been put into service, and were later supplied with semi-Diesel engines; they have gradually reduced the number of changes but the Keng Sa rapids are still impassable at low water

and necessitate trans-shipments to motor-canoes.

In 1895 a small gunboat, the Lagrandière, went up above the Savannakhet-Vientiane reaches to within 50 kilometers of the Yunnan frontier, about 2,500 kilometers from the sea and 400 meters above sea-level; this was a purely sporting exploit. Since then other steamboats have gone up as far as Luang Prabang, but it was realized that regular traffic could not be maintained through one section, dotted with dangerous rapids. Nevertheless, the trip between the two Laotian capitals previously made by native canoes plying upstream, and by rafts going downstream, has been very much speeded up since 1930 by the use of motor canoes.

In brief, progress is summed up in the following figures; in 1900, at low water, it took 65 days or more to go from Saigon to Luang Prabang; in 1909 the time was reduced to a maximum of 50 days; in 1937 the upstream trip took 37 days, downstream 27; and at high water, it took 27 or 22 days, respectively.

In spite of all this, French Upper Laos is still farther from Saigon by water than Saigon is from Marseille. Even below Vientiane in Lower Laos, the transport capacity of the Mekong depends on the obstacles encountered between Savannakhet and Khône. It is difficult to cut down the present length of the time needed for the journey: the narrowness of the channels and the limited power of the engines which can negotiate them do not

permit increasing the useful cargo beyond 100 tons. At low water, trans-shipment is a heavy burden on shipping. In 1936 only 4,644 tons of freight passed the port of Khone going downstream (10) and 5,286 tons upstream.

10. Excluding teak logs which are floated down the river.

Thus the high hopes for the Mekong as a means of transportation have been dashed. Experts believe that if additional improvements could increase the traffic to 25,000 tons a year, [116] this is a maximum which would be hard to surpass. Railways and highways will therefore have to furnish transportation which will be justified in the future by our reasonable expectations for an enlarged Laotian economy, if not by its extent at present. (11)

11. The arguments in favor of the water route are set forth by Colonel Bernard in the Bulletin du Comité de l'Indochine, February 20, 1936. Navigation on the Mekong has undergone great changes since the end of 1937, at the expiration of the contract of the Campagnie Saigonnaise de Navigation et de Transports, which had replaced the Messageries Fluviales. Steam launches no longer negotiate the Kemmarat narrows;

3: Robequain--113-116 S-5 (no date) 1944 Laotians-5
116, 133, 503, 505, 177.50 France
636.50

there is no longer a regular service between Paksé and Savannakhet. From Savannakhet to Vientiane service is now assured by a company employing flat-bottomed barges and from Vientiane to Luang Prabang and Xieng Sen by motor canoes."

7: Thompson--375 J-4 (no date) 1937 Laotians
116, 489, 503, 653

"The Mekong was the only means of communication with Cochin-Chinese seaports. The subsidy accorded to the Compagnie des Messagéries Fluviales to improve its navigation of the Mekong was too high for the colony's budget, yet inadequate for the work it had to do. Hundreds of thousands of francs were lost in acquiring a knowledge of these problems and in training a personnel. Mekong boats must reckon on three periods of navigation. In low water there are no less than eight trans-shipments between Phom-Penh and Luang-Prabang, by rail and by road, both of which were expensive and difficult to build because of the shifting surface of the land. Mid-season is the best for navigation, since high water means contending with a terrible current. Laos is desperately in need of railroads, and it has fewer than any other country in the Union. Every Governor, from Doumer on, has had railroad projects, but they have always been laid aside for other works. The recent realization of Laos's mineral wealth through journalistic propaganda has been counteracted by the depression; yet once again there is promise to fill this crying need, notably Robin's impetus to road-building in 1935-6. Unless this is soon done, Laotian commerce will escape permanently to Bangkok. Contraband can never be controlled along the great watery frontier, and Siam's comparatively duty-free imports and cheap railroad and boat transportation will always have the advantage."

36: Gourou--23 (no date) 1947 Laotians
116, 311, 361, 376, 503

"Problems of the Mekong and of Laos.

Above Kratié the mighty River Mekong is of very little use. True, it is easy to imagine a marvellous control program, a sort of grandiose Laotian T.V.A. Dams would divide the river into level reaches; locks would allow ships of large tonnage to sail as far as Luang Prabang; the dams would make possible a huge electricity production, and the irrigation of vast tracts. Rice, cotton, maize, would fill the holds of river vessels that would ply to the sea without transhipping their cargos. Pacific and profitable co-operation would be established between Indochina and Siam.... All of which are daydreams. Capital is lacking and, above all, manpower. Such works would be possible only if the lands drained by the Mekong were populous. But Laos should nevertheless not be neglected. It should draw great profit from a modernization of forest exploitation, and from the application of the measures we have outlined above. Nothing valuable, however, will be effected in Laos unless, at first, small, selected areas are developed. It is difficult to help sparse, shifting populations, who escape both health measures and education. Whereas, if the Laotians scientifically colonize their own territory, beginning with integral development of favored areas with health control, they will then be setting up centers of demographic expansion and of economic activity from which the development of the less favored regions can proceed. Only then can the Mekong's domestication be begun."

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A rapid glance at what has been done to make the river navigable will enable us to indicate the work that has been accomplished, the difficulties that have been overcome, and what still remains to be done.

The question of navigation on the Mékong was first raised by Francis Garnier in 1866 when he went up the great river as second in command of the exploratory mission to Indo-China. At this time, steam navigation on the river stopped at Kratié, about 220 kilometers upstream from Pnom-Penh. As a consequence Francis Garnier was immediately led to study the possibility of steam navigation beyond the Sambor rapids, the extreme limit of the hydrographic exploration which had then been done along the Mékong.

"Steam navigation," he said (1), "although strictly practical as

(1) Francis Garnier, op. cit. [Voyage d'exploration en Indo-Chine, 1885.]

far as the foot of the Khône waterfalls, presents a great many difficulties. Between Kratié and the island of Khône it is doubtful whether any channel exists which is deep enough at the low water period. In the high water period sufficient depth is no longer a question, but the velocity of the current reaches its maximum and is great enough to halt the progress of a steamship, or at least impede its movement."

These considerations were true at the time when the author visited these parts, but are no longer entirely applicable as concerns navigability during the high water season. Indeed, steam navigation has gradually been transformed and mechanical equipment has been perfected, yet despite all this a period of twenty-two years passed [62] before any serious and effective attempt was made to achieve results for which Francis Garnier's conclusions could not have led us to hope.

In September 1885 Post-captain Réveillère succeeded in passing, in a torpedo boat, the Préa-Tapang rapids which form the principal obstacle on the Mékong, somewhat below [illustration here] the frontier of Cambodia and Laos. In 1886 and 1887 Lieutenant-Commander de Fésigny, who was assigned to study the hydrography of the river above Kratié, made a serious study of these rapids and proved that it was possible to pass them in small ships. He first took the gunboat Sagaie to Stung-Treng, and then took the launch Mouette of the Cochinchina River Fleet [Messageries fluviales de

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Cochinchine] as far as the Khône waterfalls, as well as the launch Doc-Phu-ca of the local service.

It remained for his colleague, M. Heurtel, to pass these [63] same rapids in boats of comparatively high tonnage and thus open the regions of southern Laos to trade once and for all. At the end of August in 1889 M. Heurtel passed the rapids for the first time in the side-wheeler sea sloop Alouette, which was no less than fifty meters in length, then a few days later in the packet Cantonnais of the River Merchant Fleet. The latter was forty meters long, made a speed of nine knots and drew 1.9 meters of water, and he took it well above Stung-Treag to the very foot of the Khône waterfalls.

It had been shown that a commercial service by steamship was possible during several months, at the high water season, as far as Khône. Now that the way lay open M. Rueff, the skilful director of the Cochinchinese River Merchant Fleet [Messageries fluviales de Cochinchine], hastened to extend a regular line of steam navigation along the great river beyond Kratié, first to Samboc, then to Sambor, and finally to Stung-Treng and Khône (1890).

Since 1891 the Bassac, which was specially built to order for the Cochinchinese River Merchant Fleet by the Dubigeon yards in Nantes so that it could pass rapids and shallows (it draws only .7 meter of water when loaded), has provided regular and rapid communication between Saigon, Pnom-Penh and Khône.

There remained the ticklish question of finding a channel through the Khône rapids. Francis Garnier was quite categorical on this point. "At the cataracts themselves," he said, "continuous navigation of the Mekong must necessarily stop unless gigantic projects are undertaken." (1)

(1) Francis Garnier, op. cit. [Voyage d'exploration en Indo-Chine, 1885.]

People nevertheless believed that a practicable passage existed, for pirogues arrived in Pnom-Penh each year which came directly from Bassac. It was also learned, at the same time (this was in 1891), that Siamese sloops were navigating on the Moun and would perhaps soon even come down the great river as far as Bassac.

[64] "The work of the Siamese," wrote M. Delaporte, a former

503 member of the Lagrée mission, in 1891 (1), "have resulted in a plan

[113] (1) L. Delaporte, La grande voie commerciale de l'Indo-Chine, 1891.

505 to establish a complete service serving the course of the Mékong, in order to divert its trade to the heart of the kingdom of Siam via the fine Sé-Moun river and then take it by railway to the capital and the sea. This plan is now in the process of full achievement. Two steamships will very shortly be introduced, one on the middle course of the river between Bassac and Kemmarat with its headquarters at Pak-Moun at the river junction, and the other on the Sé-Moun between Pak-Moun and Khorat at the point where the river ceases to be navigab and this service will be completed by a railway joining Khorat to Bangkok."

505 503 654 It was thus a question of out-distancing the Siamese sloops. Governor General Piquet himself became interested in the matter and embarked on board the Cantonnais (October 1891) in the hope of passing the Khône rapids and showing the French flag in the upper reach. The Argus, under the command of Ensign Guissez and serving as a look-out ship for the Cantonnais, reached Khône and tried to reconnoiter the passage. The latter had been shown by the inhabitants to M. Pelletier and Dr. Mougeot, two Europeans who then held the concession to the large island of Ca-Lomnieu, and was accessible at certain times of the year to pirogues coming down the river. But the season was far advanced (it was the end of October). The low water made it impossible to attempt the desired trial, and the Cantonnais had to return to Saigon.

In the meantime the Argus anchored in the pass of Ka-Sedam between the rapids of Tat-Vai and Tat-Liou in order to complete the studies which had been begun and the exploration of the river as far upstream as possible. For more than two years this launch tried to negotiate the passes, but failed because of its large draft, its instability and its lack of speed.

The persevering energy and efforts of its commander were not lost, however, for they prepared the way for the work subsequently undertaken in these parts.

It being impossible to find a suitable passage for [65] [Illustration] [66] [Blank page] [67] steamships, a transshipment railway was built

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across the island of Khône. It was further necessary to establish two docks, one a tidal dock and the other a launching basin, at South Khône and at North Khône, especially for the transshipment of launch cargoes.

Lieutenant Commander Simon expressed himself as follows in a lecture which he delivered to the Geography Society [Société de Géographie] on May 15, 1896:

"Believing themselves protected, thanks to this natural barrier, from any repressive measures on our part, the Siamese had crossed the Mékong at Kemmarat, Lakhône and Outhène and were invading Annam little by little and establishing advance posts as little as three days away from Hué. This took place in 1892.

"The government became alarmed, and in order to satisfy solicitations by Cochinchina at the same time, it decided at the suggestion of M. Delcassé in March 1893 to purchase two screw-propelled gunboats, the La Grandière and the Massie, which were intended to exercise surveillance over the upper Mékong.

"These two ships were to be set afloat above the Khône waterfalls. From there they were to negotiate, by any possible means, the Kemmarat gorge which is particularly dangerous for its rapids, and then show their flag at daybreak in the great reach, presumably navigable, which extends from Kemmarat to Vien-Tiane and whose eastern bank includes Annamite Laos.

"Such was the object of the mission which was entrusted to us.

"It was at the same time a hydrographic mission whose work was to take the Khône waterfalls, which steam navigation has today brought within four days' journey of Saigon, as its point of departure and stop only when it was materially impossible to proceed any further.

"As far upriver as possible and as far as possible, these were the orders of the day.

"The ships, which were demountable in five sections, were assembled and set afloat at Saigon in August 1893, and their transshipment past the waterfalls was accomplished in one piece, that is to say without disassembling them, on a carriage which was built for the purpose and which rolled along a track. The track, which was one meter wide, started at the downstream end of the falls, that is to say in the lower basin, and ended in the upper basin after crossing the island of Khône.

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"The administration of public works of Cochinchina was particularly responsible for carrying out the work. The operation was directed by Messrs. Gubiand, the engineering director of public works, and Crouzat, the chief clerk of the department of civil engineering [conducteur principal des ponts et chaussées], and was fully successful despite the haste, the difficulties and the mishaps and tribulations which we had to undergo.

"On October 31, 1893, five months after the mission's arrival in Saigon, two ships, the Massie and the Ham-Luong, had passed the Khône waterfalls.

"The Ham-Luong was a sloop from Cochinchina which was sent at the last [68] moment and in all haste to replace the La Grandière numerically and provisorily, the latter being disabled below the falls as the result of grave damage to the engine."

After they had been floated in the upper reach the Massie and the Ham-Luong pushed on to Bassoc immediately, then to the junction with the Sé-Moun. The Massie finally reached Kemmarat on February 28, 1894, after successfully passing the 120 kilometers of rapids just below it. There the Massie had to wait for high water before it could pass the Keng-Sa, one of the most dangerous obstacles in this region. In the high water season of 1894 it was in the Vien-Tiane reach, where it showed the French flag over an extent of more than 500 kilometers. On September 5, 1894, the La Grandière went to Khône in its turn, on its way from one reach to another, and then in November caught up with the Massie which it soon passed. Finally in August 1895 Lieutenant Commander Simon took the La Grandière through the series of rapids stretching over a distance of 350 kilometers between Vien-Tiane and Luang-Prabang, which he reached on September 1.

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"This brilliant success demonstrated France's power to the friendly and hostile populations of the banks of the Mékong. Through the more frequent sight of our officers, our weapons and our cruising steamships, which ammounted to ambulatory offices, it strengthened the work accomplished by our diplomats on the left bank, which belonged to us henceforth" (1).

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(1) Lanier, L'Asie, 1898. Selected readings in geography.

We rejoice at being able to render deserved homage here to the abilities of Commander Simon who, in the midst of the greatest

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difficulties, was able to complete the daring work which he had assumed. He did not fear to turn his own hand to the task by giving largely of himself and often remaining in a pirogue in the middle of the river, despite the heat of the sun, in order to seek out a passage for his gunboat.

But Luang-Prabang was not to be the terminus of the La Grandière's journey.

[89] "The difficulties which had long been pending in western upper Laos had just entered into a more acute phase. It was more than ever timely and urgent for us to strengthen our diplomatic arguments with the help of effective justifications of our rights based on accomplished facts.

"We had to show our colors still farther upstream, at least as high as Xieng-Khong, that is to say, in the heart of the territories which others had attempted to detach from our influence by proposing that they remain neutral" (1).

(1) Lieutenant Commander Simon, op. cit. [Lecture delivered to the Société de Géographie on May 15, 1896.]

On September 8, the La Grandière resumed its march upriver. "Finally we reached our last stage, Tang-Hô, on October 25, 1895. We were a day's journey from Xieng-Lap, at 20° 40' N. latitude, 2500 kilometers from the sea and at an altitude of more than 400 meters. Here the La Grandière was stopped once and for all, for in the present state of things Tang-Hô must be regarded as the limit of all possible ventures in steam navigation, at least when the water level is low" (2).

(2) Lieutenant Commander Simon, op. cit.

These conclusions did not give pause to Lieutenant Commander Mazeran, for he took his gunboat further still. It is now at Xieng-Lap, immobilized and unable to return downriver. There is some question of disarming it and attempting to bring it down to Luang-Prabang by surrounding it with a bamboo sheath. It could at least be used and render some service in Luang-Prabang.

The results of Lieutenant Commander Simon's mission relative to the navigability of the reaches of Bassac and Vien-Tiane enabled the Cochinchina River Merchant Fleet Company [compagnie des

505 Messageries fluviales de Cochinchine] to introduce a regular service
503 of steam launches there. To this end the company signed a contract
654 with the general government of Indo-China, the purpose of which was to organize a complete service from Saigon to Luang-Prabang for passengers and merchandise, using steamships and pirogues by turns, depending on the navigability of the river and on the season. The task was a difficult one, for it was first necessary to enlarge the [70] tidal docks and launching basins and to rebuild, strengthen and correct the railway on the island of Khône to permit the transshipment of three steam launches weighing seventy tons each (1). This [Illustration

(1) The gunboats Massie and La Grandière weighed only twenty-two tons each.

here] was a veritable tour de force which had to be repeated three times. During the high water period of 1893 (2) the operation was

(2) For this transshipment, as for that of 1894, human labor was the driving force. Only since August 1898 has a locomotive run along this railway.

carried out with complete success, [71] [Illustration] [72] [Blank page] [73] thanks to the combined work and efforts of the local administration and the River Merchant Fleet Company [compagnie des Messageries fluviales]. Today one of these ships, the Garcerie, is assigned to regular service in the Bassac reach between Khône and Pak-Moun. The two others, the Trentinian and the Colombert, have followed the path laid out for them by the gunboats through the Kemmarat rapids and provide service in the Vien-Tiane reach over a distance of nearly 500 kilometers (1).

(1) Just recently the launch Hamluong, which is 22 meters long, has a draft of 1.3 meters and a speed of seven to eight knots, has gone upriver through the Kemmarat rapids under the command of the engineer Jeanneau and has reached Vien-Tiane where it is at the disposition of the Superior Resident.

503 Here, then, is an initial result achieved. During the high water
505 period steamships can provide service from Kratié to Khône. Others

have been introduced in the upper reaches and can easily serve, during the high water period, nearly 200 kilometers in the Bassac reach and nearly 500 in the Vien-Tiane reach. But during the low-water period the stretch between Kratié and Khône is still served by pirogue over the greater part of the course. Then the navigable reach of Bassac is reduced to thirty kilometers for steam launches, and the Vien-Tiane reach requires transshipment by pirogue over some twenty kilometers between two stretches covered in the above manner. The two reaches are, moreover, separated by a 160-kilometer strip which is not navigable in any season.

The impetus has therefore been given, and the way lies open. Today it remains only to complete the work thus begun and to finish setting the necessary beacons and clearing the bed of rocks before navigation, and that is to say trade, can be expanded further. Let us recapitulate what has been done and what has been proposed.

First of all, from the budgetary point of view, a sum of 87,500 francs has so far figured annually in the budget of Laos under the label Studies and projects for the navigability of the Mékong. This sum was further increased in 1900, and in the budget for public works in the general interest the following credits appeared:

	francs
Navigability of the Upper Mekong. Purchase of materials for clearing rocks and laying beacons	25,000
[74] Clearing rocks and laying beacons in the lower reach	12,500
Clearing rocks and laying beacons in the middle and upper reaches	62,500
Continuation of studies	25,000
TOTAL	125,000(1)

(1) In 1901 the following figures appeared in the general budget:

Clearing rocks and setting beacons in the Upper Mekong in the lower and middle reaches	75,000
In the upper reach	25,000
Studies	25,000
TOTAL	125,000

It may therefore be assumed that several thousands of francs have already been spent to make the great river navigable. It must be admitted that so far the visible results have not compensated for the sacrifices made, and we prefer to suppose that such credits are

503 entered in the budget annually to satisfy the public opinion which
652 demands them, but that in reality they are far from being spent. If they have been used it has been without appreciable profit, probably as the result of the lack of a master plan governing the work to be accomplished. Indeed it is our earnest hope that expenditures of this size have not been occasioned by the few scientific missions composed of officers and engineers from the department of civil engineering.

Here, in this connection, is an extract from the interesting notice on Indo-China published at the time of the Universal Exposition of 1900:

503 "Since 1887 many missions have studied the reach between Kratié and Khône and have traced the routes which today enable the steamships of the River Merchant Fleet [Messageries fluviales] to navigate there during the high water season. But a great deal remains to be done, and a more complete work of clearing rocks and setting beacons, if pursued perseveringly and methodically, would certainly make it possible to increase the period of navigability by several months each year. The enlargement of the canal between Stung-Treng and Thboung-Kla has already made it possible for launches to ply between Don-Logna and Siem-Boc (2) all year long

(2) In May 1897, that is to say during the low water period, Lieutenant Commander Ytier was able to negotiate the stretch between Kratié and Stung-Treng in a launch which drew 1.5 meters of water (the Sambor). He concluded that after a few rocks had been cleared and buoys set out to mark the route the Mékong would be navigable between Kratié and Stung-Treng, during the low water period, for a boat with a draft of one meter and a speed of twelve knots in a speed trial. But he added that "navigation would always remain difficult or at least ticklish during the low water period, and that without a practical man, without a Talcon pilot, the shelves could not be negotiated and there would be an almost certain risk of running aground."

over a distance of sixty to eighty kilometers. [75] [Illustration] [76] [Blank page] [77] The same will certainly be true below Siem-Boc, in the part of the rapids which are properly known as those of Préapatang, when they have been more fully studied, buoyed and

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cleared of the rocks which obstruct them.

"In 1893 and 1894 another mission studied the whole upper reach of the river above Khône and as far as Vien-Tiane and Nong-Khay, and extremely complete maps were drawn up which made it possible in the years following to organize the regular services of the River Merchant Fleet [Messageries fluviales] which now provide frequent communication between all the posts on the Mékong as far as Luang-Prabang.

"This mission called attention to certain passages which might be greatly improved by setting buoys and clearing rocks, thereby rendering navigation possible during the high water period. It showed the necessity of complementary studies at other points, particularly some distance upstream from Kemmarat and over the whole stretch between Vien-Tiane and Luang-Prabang.

"Moreover, a special committee for studying plans for improving the Mékong has been formed in Saigon for the purpose of assembling and centralizing all the studies made so far and of drawing up a program of action for the achievement of which large credits have been appropriated in the general budget of Indo-China.

"There is reason to hope that this program will soon be elaborated and carried out, and that within a few years, when the entire course of the Mékong has been made accessible to steam navigation, the products of the rich regions which it waters will no longer be exported by other roues than those of Cambodia and Cochinchina, but will come down in toto to Saigon and there be reexported to all parts of the world."

We note, moreover, that all efforts to make the Kemmarat rapids navigable have been abandoned. The Superior Resident in Laos says, in fact, in a report (1):

(1) Report sent to the directors of the Agriculture and Commerce bureaus in April 1899.

"The exploratory work which has been done both by the engineers and by the officers of the Mékong hydrographic mission have demonstrated that the rapids which extend, on the one hand, from Pak-Moun to Hueûn-Hin south of Savannakhèt, and those which are found, on the other hand, starting at Sam-Pan-Na north of Vien-Tiane, [78] cannot be rendered negotiable by steamship except by means of considerable labor and of expenditures whose total it is impossible to

503 predict. It has therefore been decided that, for the moment at least, no more attention should be given to these rapids and that our concern should be restricted to accomplishing the labors necessary to facilitate steam navigation during the low water period in the following reaches:

"1. from Kratié to Stung-Treng and Khône;

"2. between Khône and Pak-Moun;

"3. between Savannakhèt and Sam-Pan-Na."

It might perhaps be understandable that the plan to make these rapids navigable should have been abandoned, if haste were made to build a railway joining the middle Mékong to some port in Annam, when the rapids would become an absolute barrier which we should [138] no longer think of overcoming. But such is not the case, and many long years will still have to pass before the products of the markets of Luang-Prabang and Nong-Khay can reach the Annam coast in any practical way. Moreover, if the work on the navigability of the Mékong continues to go forward at the same slow rate and if we do not take greater advantage of this "moving highway," we shall continue to play into the hands of the Siamese and the market in Bangkok, thanks to the Korat railway, will continue to absorb the Laotian products which should have no other outlets than Saigon, Tourane and Vinh.

d.--DESCRIPTION OF THE DIFFERENT REACHES

1. The Upper Reach

133 505 The Mékong enters Laos where it is joined by the Nam-La, at 21° 40' N. latitude, slightly downstream from Xieng-Hong which is on the 22nd parallel. As far as Xieng-Sèn it flows in an approximately northeast and southwest direction between two ranges of peaks which constrict its bed and make it a torrent rather than a river. In this narrow corridor it has dug a channel which varies, during the high water period, from 150 to 300 meters in width and which sometimes grows as narrow as 50 meters during the low water period. Its bed is generally encumbered with shoals and [79] rocks; and the whirlpools, eddies, currents and counter-currents make navigation impossible. Thus Lieutenant Commander Mazeran's bold and successful venture deserves mention here, for he succeeded in taking the gunboat La Grandière as far as Xieng-Kok, that is to say nearly to the 21st